REMARKS

Claims 1-11 are pending. Claims 1 and 9 are independent.

Applicant amended independent claim 9 to correct a typographical error in the preamble.

The examiner rejected claim 9 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,530,991 to Tanaka et al. Additionally, the examiner rejected claims 1-8 and 10-11 under 35 U.S.C. §103(a) as being unpatentable over Tanaka in view of U.S. Patent No. 5,003,548 to Bour et al.

With respect to independent claim 9, the examiner stated:

> Regarding claim 9, Tanaka et al discloses a radiation-emitting semiconductor chip based on AlGaInP comprising - a substrate (12); - a semiconductor layer sequence (14) applied to said substrate and comprising a photon-emitting active layer (22); and - a transparent decoupling layer (16) disposed on said semiconductor layer sequence (14), characterized in that - said substrate (12) is formed of germanium (column 23, lines 33-67 thru column 24, lines 1-14). (Office Action, page 2, paragraph 2)

Applicant respectfully disagrees.

As examiner knows, and as provided in MPEP 2131:

> **"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). ... The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).**

Applicant's independent claim 9 recites "[a] radiation-emitting semiconductor chip based on AlGaInP comprising: a substrate; a semiconductor layer sequence applied to said substrate and comprising a photon-emitting active layer; and a transparent decoupling layer disposed on said semiconductor layer sequence, wherein said substrate is formed of germanium." Thus, claim 9 requires, among other things, a radiation-emitting semiconductor chip that includes a transparent decoupling layer through which light produced by the active layer is decoupled.

Tanaka, on the other hand, describes a method for the formation of a semiconductor layer by which structural defects, particularly defects pertaining to threading dislocations, can be reduced (Abstract). To that end, Tanaka applies tetrathylsilane (TESi) material to a GaN layer, and subsequently provides trimethylgallium (TMG) and ammonia (NH_3) to form a semiconductor layer (FIGS. 3a-3d, and col. 11, line 66 to col. 12, line 6). Tanaka explains:

> **As a result, the TESi functions to suppress structural defects, particularly growth of threading dislocations, whereby structural defects, particularly a dislocation density of the GaN layer 18 which is formed as a semiconductor layer by supplying trimethylgallium (TMG) and ammonia (NH_3) after the supply of TESi as a result of crystal growth of GaN could be remarkably reduced.**

However, at no place does Tanaka describe that the TESi material is transparent and/or that it is the layer that decouples light from the active layer to outside of the device. To the contrary, Tanaka does not at all describe any type of device, but rather focuses on the manufacture of individual semiconductor layers such that structural defects are reduced. Accordingly, Tanaka does not disclose or suggest at least "a radiation-emitting semiconductor chip" and/or "a transparent decoupling layer disposed on said semiconductor layer sequence," as required by applicant's independent claim 9. Applicant's independent claim 9 is therefore patentable over the cited art.

Claims 10-11 depend from independent claim 9 and are therefore patentable for at least the same reasons as independent claim 9.

As noted, the examiner rejected independent claim 1 as being obvious over Tanaka in view of Bour. Specifically, the examiner stated:

> Regarding claim 1, Tanaka et al discloses a method of fabricating a radiation-emitting semiconductor chip based on AlGaInP, comprising the method steps of. preparing a substrate (12); applying to said substrate a semiconductor layer sequence comprising a photon-emitting active layer (22); and applying a transparent decoupling layer (16), wherein said substrate (12) is formed substantially of germanium (column 23, lines 33-67 thru column 24, lines 1-14). However, Tanaka et al does not disclose said transparent decoupling layer (16) is applied in a temperature range extending no higher than 800C.
>
> Bour et al discloses said transparent decoupling layer (16) is applied in a temperature range extending no higher than 800C (column 2, lines 9-44).

> It is obvious, at the time the invention was made, for one having ordinary skill in the art, to modify Tanaka et al with the teachings of Bour et al for the purpose of applying temperature to a transparent decoupling layer in order to help with the epitaxial growth rate. (Office Action, pages 3-4, paragraph 4)

Applicant's respectfully disagrees that either Tanaka or Bour disclose all the recited elements of independent claim 1, and/or that a motivation exists for combining Bour with Tanaka.

Applicant independent claim 1 recites "applying a transparent decoupling layer."

As explained above, Tanaka neither describes nor suggests a transparent decoupling layer and therefore Tanaka does not disclose at least "applying a transparent decoupling layer."

Bour describes quantum well short wavelength AlGaInP semiconductor lasers (Abstract). Particularly, as described in relation to FIG. 4, a quantum well semiconductor layer is disposed between two AlGaInP cladding layers. Two GaInP buffer layers flank the quantum well and cladding layers. An AuGeNi ohmetic metal contact is placed on top of this sequential structure of layers. The structure is disposed on a GaAs substrate (see col. 5, line 32, to col. 6, line 30). Because the AuGeNi ohmic metal contact on top of the layer structure covers the entire active structure of the laser, light emission through the top surface of the layer structure is not possible. Rather, it appears from the description that Bour's semiconductor laser is an edge-emitting laser which emits light in a direction parallel to the layer structure through a side surface of the structure, but not in a vertical direction (i.e., through the top and/or bottom surfaces of the layer structure) that is perpendicular to the layer structure. Thus, Bour neither describes nor suggests transparent decoupling layer for decoupling the generated light emission to the outside of Bour's laser device. Bour, therefore, does not disclose or suggest at least "applying a transparent decoupling layer," as required by applicant's independent claim 1.

Moreover, applicant contends that in any event there exists no motivation for combining Bour with Tanaka.

Applicant's independent claim 1 recites "said transparent decoupling layer is applied in a temperature range extending no higher than 800°C."

The examiner admitted that "[h]owever, Tanaka et al does not disclose said transparent decoupling layer is applied at a temperature range extending no higher than 800C" (Office Action, page 4). Indeed, Tanaka states that the temperature required in the reactor when applying the TESi material is 1080°C (see, for example, FIGS. 4(c), 8(b)). Thus, Tanaka calls for reactor temperatures higher than 800°C when applying the TESi material.

Accordingly, although Bour describes temperatures lower than 800°C for its semiconductor laser manufacturing procedure, because Tanaka requires reactor temperatures higher than 800°C when applying the TESi material, Bour's teachings, therefore, conflict with Tanaka's teachings. Thus, Bour teaches away from Tanaka (see MPEP 2145)

Accordingly, even assuming *arguendo* that the TESi material is a decoupling layer (which applicant, for the reasons provided above, believes is an incorrect characterization of the TESi material) the Tanaka and Bour references cannot, in any event, be combined.

Because neither Tanaka nor Bour discloses or suggests, alone or in combination, at least "applying a transparent decoupling layer," and because no motivation or suggestion exists for combining Tanaka and Bour, the examiner has thus failed to establish a prima facie case of obviousness with respect to independent claim 1. Applicant's independent claim 1 is therefore patentable over the cited art.

Claims 2-8 depend from independent claim 1 and are therefore patentable over the cited art for at least the same reasons as independent claim 1.

It is believed that all the rejections and/or objections raised by the examiner have been addressed.

In view of the foregoing remarks, Applicant respectfully submits that the application is in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good

reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

Enclosed is a Petition for One Month Extension of Time. The fees in the amount of $120 are being paid concurrently on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other required fees to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

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